

Smallholder crop farmers' attributes for formal financial services in Nigeria: An analysis

Innocent Asuquo^{1,*}, Eucharia Ajah¹ and Emmanuel Eyo¹

Department of Agricultural Economics, University of Calabar, Nigeria

*Corresponding author's e-mail: innocent_asuquo@yahoo.com

Financial services to the agricultural sub-sector in Nigeria and particularly to small farmers is difficult because financial institutions have specific requirements that must be met. Many small farmers are hardly serviced and this has affected the growth of the sector. Nevertheless, understanding the nature of the sector and peculiarities of categories of farmers will help build an efficient financial system that is beneficial to farmers and financial institutions alike. This study examined attributes of formal financial institutions smallholder crop farmers prefer for better financial services in Nigeria. Data were elicited from the six agro-ecological zones of the country using the extension officers in Agricultural Development Projects (ADP) of the different states. A total of 399 smallholder crop farmers were sampled and the study used the conjoint technique and multinomial logistic technique in analyzing the data. Results revealed that financial services such as loan, insurance, account opening, credit/debit cards, and funds transfer, were highly rated and preferred by most smallholder crop farmers. However, these farmers were more inclined to loans that were customized (flex loans), insurance claims due within 90 days, savings account opening, cash points for credit/ debit cards within a kilometer of their residence, and funds transferred in 24 hours. Conjoint analysis of the key variables showed that funds transfer within 24 hours was the only significant variable; and the interaction effect (trade-off effect) of this variable with others revealed that, an average smallholder crop farmer would rather prefer loan that is customized, insurance claim within 90 days, and a cash point within a kilometer of his residence to funds that would take longer than 24hrs to arrive. The multinomial result showed that a farmer's level of education, gender, and farm size were key determinants of an average farmer's choice of a financial institution. The study, therefore, recommends that, financial institutions should optimize their services in terms of funds transfer and accessibility, and should emphasize only services that are important so as to operate maximally.

JEL Classification: Q14, G21, G22, G29, G41.

Keywords: Formal financial services, Nigeria, smallholder crop farmers, conjoint analysis, multinomial logistic.

INTRODUCTION

Agriculture is the bedrock of economic growth, development and poverty eradication in developing economies (Department for International Development-DFID, 2005). It is regarded as the panacea for economic doldrums. In other words, the development of the economy as a whole depends on agricultural sector even though many development specialists and economists still hold the view that the path to economic prosperity is varied and subject to debate and opinions.

The process of modernization and commercialization of agriculture and by extension, the rural economy, depends on financial services rendered by financial institutions (Ike, 1986). These roles include savings and credit, wealth

management, mutual funds, insurance, advisory on production techniques; etc. According to International Fund for Agricultural Development (IFAD, 2004), financial services are a pre-condition for agricultural development; appropriate savings and credit systems that address the particular needs and constraints of the poor are important tools for increasing production among the rural poor. It implies, therefore, that savings and credit are salient and at the apex of financial service requirements of most poor and by extension, smallholder farmers. Studies confirmed that most farming and rural communities are mostly inhabited by this group of farmers who produce more than 75% of agricultural production in Nigeria (Mgbeaka, Mbah, and Ezeano, 2015; Sabo, Isah, Chamo, and Rabi, 2017). It has also been observed that majority of these farmers are excluded from

participating in many agricultural credit programmes instituted by government especially when such financial programmes are channeled through the conventional financial institutions. According to [Adewunmi and Omotesho \(2002\)](#), and [Tchale \(2009\)](#), Sub-Saharan Africa's agriculture generally suffers this fate, and this explains the state of agricultural production across the sub-region because the socio-economic characteristics of these farmers and the nature of production is never considered.

Farmers in Nigeria equally face this fate and are not treated differently in the provision of financial services despite contributing more than 40% of the nation's Gross Domestic Product-GDP ([CBN, 2012](#)). While farmers are becoming more withdrawn in accessing these services because of difficulty faced, policy analysts are of the view that farmers are denied access because of not possessing the needed capacity to merit these services. For instance, most banks only give loans to farmers who have saved reasonably enough to merit loans. This is in fact the norm with most financial institutions. However, accessing loans is much more than having the capacity. It involves attributes such as loan decision and disbursement time, the lender-borrower relationship, the loan amount given, interest rate, etc. These attributes are admissible to encouraging or discouraging a potential borrower depending on the circumstance and are extremely germane in efficient loan system but have not been carefully analyzed by many lenders. According to [Bard, Craig and Boehlje \(2002\)](#), if a "lender can determine what is, and is not important to borrowers, such a lender has the potential to become more competitive by segmenting the market and providing the desired products and services to the segmented borrowers". Therefore, like many borrowers or customers, smallholder crop farmers are peculiar in their characteristics and understanding this, is important to what financial service should be provided. Consequently, knowing the relative importance of the financial service attributes, in addition to what matters to a farmer can help lenders provide the desired services and be more competitive in the financial market.

Generally, formal financial institutions are known to be profit oriented; focusing mainly on businesses that have 'quick turnover'. In rendering services and particularly in giving loans, these businesses are considered first. Unfortunately, agriculture has a long gestation period and smallholder crop farming does not possess the 'quick turnover' characteristics required by many financial institutions. The problem is that, smallholder farmers fall far below the pecking order of potential service customers and borrowers. Consequently, if financial service play a role in agricultural modernization and commercialization as noted by [Ike \(1986\)](#) and [Sidhu et al \(2008\)](#), and smallholder farmers who produce more than 75% of Nigeria's food and raw materials are hardly serviced then, modernization of this sector is in dire straits. In other words, the sector may not grow as it should and ultimately, the general economy will be affected.

If smallholder crop farmers are important to the development of agricultural subsector in Nigeria as it has widely been recorded, it is necessary to give serious thoughts to their growth because collectively they are the foundation on which the sector rest. Many formal financial institutions admit to denying them key services because of lacking the capacity of meeting up with the requirements. As earlier observed, even government loan programmes do not equally favour this group and, [Arene \(1993\)](#), noted that many government designed agricultural programmes and not just loan programmes equally relegate these farmers to the background. While various reasons may be adduced, [Etim, Eyo and Enimu \(2017\)](#) however, observed that, if financial services and other programmes are to work better for the rural and agricultural populations, they need to be based on the understanding of the needs of the users.

In other words, financial service providers, government and agricultural donor agencies do not have a good understanding of the financial behavior, usage and needs of these farmers and this, somehow, restricts the effectiveness of outreach and participation. Essentially, if financial services are driven by a better understanding of farmers' needs, capacity building to meeting up with the requirements will be properly crafted such that issues surrounding the development of the sector will be well founded. Therefore, extending financial services to smallholder crop farmers will be more meaningful if the socio-cultural characteristics of the farmers are known and issues of withdrawn attitude and repayment (in case of loans) will be resolved.

Based on the foregoing, the objective of this paper is to investigate attributes small scale crop farmers have preferences for in seeking for financial services from formal financial institutions in Nigeria. In doing this, conjoint analytical technique is used in estimating the attributes' effect on satisfaction or utility derived from the services rendered; multinomial analysis is also deployed in determining farmers' selected demographics on institution's choices.

There are many studies on small-scale crop farming in Nigeria and many more on credit demand, supply and repayment, but none on formal institutions' attributes preference. This is the uniqueness of this study. In addition to this, the study is also the first to consider holistically financial services that are typical to smallholder crop farmers considering their importance in the Nigerian economy. In doing so, the study uses analytical techniques that have not been used before in a study of this kind. On the other hand, it is the desire of policy makers that small scale businesses (agriculture inclusive) should be given the necessary support financially and, financial institutions wish that small farmers should be serviced well and adequately even though they have been constraints by a number of factors in this regard. This study will open up areas from the demand side that will guarantee service delivery. Therefore, financial institutions and farmers will greatly benefit from the findings. Farmers' financial



service demands are driven by certain attributes which are very key to their productivity and, financial institutions will have less repayment problems if these attributes are noted and incorporated into their credit systems. Consequently, the study's hypotheses are set as follows:

Ho1: Farmers' choices or preferences of a financial institution are not significantly influenced by the attributes.

Ho2: Farmers' demographics do not affect financial institution's choice.

MATERIALS AND METHODS

Data for this study were sourced from the six agro-ecological zones of the country transiting in south-north direction from the Atlantic coast to the arid of the Sahel. These zones are; Mangrove swamps, Rainforest, Derived savanna, Guinea savanna, Sudan savanna and Sahel savanna. Rainfall is bimodal in the mangrove, rainforest and parts of the derived savanna zones and unimodal in the guinea, Sudan and Sahel savannas. Annual rainfall varies from 500mm per year in the Sahel to about 3000mm in the mangrove.

With a landmass of 923,768km², lying along latitudes 4°1' and 13°9'N and longitudes 2°2' and 14°30'E, bounded by the Atlantic Ocean to the south and the Sahelian countries of Niger and Chad to the North, Nigeria's mainstay is agriculture, which contributes more than 45% of the Gross Domestic Product (GDP) (Central Bank of Nigeria (CBN), 2012). Of this landmass, agricultural land area is about 84 million hectares with about 33 million hectares currently under cultivation (www.yieldgap.org/Nigeria). About 3 million hectares of the agricultural land is irrigable but only about 220,000 hectares is actually irrigated. The major staple crops in Nigeria are cassava, yam, maize, sorghum, rice and millet. These crops together cover 65% of the total cultivated area. Cassava, yam and cocoyam are the major staple crops in the humid parts of the country, while sorghum, millet, cowpea and groundnut are the staples in the sub-humid and semi-arid parts. Maize is grown in all parts of the country. For cash crops, cocoa, oil palm, cotton, groundnuts, ginger and sesame are the most predominant.

Farming in Nigeria is predominantly done in small holdings with the vast majority of farmers cultivating less than 1ha of land (www.yieldgap.org/Nigeria). There is little mechanization with cultivation carried out with hoe and cutlasses. A large number of farmers in the northern guinea, Sudan and Sahel zones also use Ox-drawn ploughs for land preparation.

Cereals (maize and millet) and legumes (cowpea and groundnut) are often grown in annual double-cropping systems in the Sudan and Guinea savanna zones, and sorghum is mainly grown in single-cropping systems. Typical double cropping systems in these zones include; maize-cowpea, millet-maize, millet-cowpea and groundnut-maize. In the wetter regions in the south, maize may be grown in double

cropping systems such as maize-maize. Intercropping is widely practiced in different parts of Nigeria. In the North, cereals are often intercropped with legumes or with other cereals, whereas maize is usually intercropped with root and tuber crops in the south.

A total of 113,097 farmers from the six agro-ecological zones formed the sample frame for this study. Multi-stage sampling method was used in selecting the respondents for the study. For instance, for the Rainforest and Mangrove zones, which are in States such as; Cross River, Akwa Ibom, Rivers, Bayelsa, Edo and Delta; 3 states were randomly selected and the states were: Delta, Cross River and Akwa Ibom. In Cross River, for instance, there are 3 agricultural zones of Calabar, Ikom and Ogoja, each zone has 7, 6 and 6 local governments and, 4,3, and 3 local governments were again, randomly selected. The same process was used in the other agro-ecological zones. From the list of registered small scale crop farmers (113,097) with the different States' Agricultural Development Projects (ADPs), a sample size of 399 was selected using error margin of 5% after a data cleaning process. ADPs staffers and agricultural extension officers were then used in eliciting information from the selected farmers using the questionnaire as instrument of data collection.

To examine the null hypothesis (Ho1) "that there is no significant difference in attributes effect on farmers' choices of a financial institution, a conjoint model was estimated. Conjoint analysis is a statistical technique with a long history in marketing research and environmental economics (Sayadi *et al.*, 2005). Conjoint analysis is one of several trade-off analytical tools and is based on decompositional approach where respondents react to a set of total profile description and part-worths for the individual attributes, given some type of composition rule (Bard *et al.*, 2002). In other words, an individual's utility for a product or service is decomposed into some combination of part-worth utilities defined for the relevant characteristics or attributes of the product. The number of attributes and attribute levels used for the analysis has significant implications for the data collection part of conjoint analysis. The attributes need to address the appropriate dimensions of the product or service, and the attribute levels need to be varied enough to generate differentiation in responses. However, if too many attributes and attribute levels are considered, the number of possible product profile becomes very large and infeasible for a participant to answer. A 5-point rating scale was deployed in measuring the financial service attributes and a rating of <2.5 implied a non- acceptability of the attribute. A t-statistic test was then used to compare the means of the highest and lowest rating attribute.

The part-worth utilities and thus the overall utility is estimated using econometric methods. Ordinary least square (OLS) is a frequent method used and the conjoint model is specified as follows:



$$X_{i1,i2,...,ij} = \sum_{k=1}^n + \sum_{k=0}^n \quad (1)$$

Where X_i = respondents' overall evaluation of a stimulus profile with level i of attributes 1, 2,... j and, \equiv denotes least squares approximation, X are the main effects, and k are the two-way interaction effects.

In this study, each respondent was presented with a limited set of full-attribute profiles. The key attributes in financial services and their associated levels were identified from literature and through a pre-survey of the respondents. Ordinary least squares (OLS) technique was then employed to estimate the part-worth utilities. The levels of the attributes were the independent variables expressed in a dummy form (0, 1); 0 meaning the absence of the level and 1 its presence. Attributes with *a priori* expectation of being more favorable were represented by '1' and '0' otherwise.

For this study, the financial service attributes and their levels were measured thus:

1. Loan (customized, typical, standard)
2. Insurance (claims are paid within 90 days, 91-120 days, more than 120 days)
3. Account opening (savings, current, fixed deposit)
4. Credit/ debit cards (funds can be accessed within 1km, 2-10km, more than 10km)
5. Funds transfer (in 24hrs, 2-7 days, more than 7 days).

$$Y_i = \alpha_0 + \alpha_1k + \alpha_290 + \alpha_3S + \alpha_41km + \alpha_524hrs + \alpha_6St + \alpha_7k90 + \alpha_8ks + \alpha_9k1km + \alpha_{10}k24hrs + \alpha_{11}St90 + \alpha_{12}Sts + \alpha_{13}St1km + \alpha_{14}St24hrs + e \dots\dots\dots 2$$

Where: Y_i = the overall utility of the i th profile ($i=1$); α_0 = intercept; $\alpha_1 - \alpha_6$ = coefficients of the main effects; $\alpha_7 - \alpha_{14}$ = coefficients of the 2-way effects; k = "customized loan term" attribute; 90 = "insurance claims within 90 days" attribute; S = "savings account" attribute; $1km$ = "funds are accessed with credit cards within 1km" attribute; $24hrs$ = "funds transfer within 24hrs" attribute; St = "standard loan term" attribute; $K90$ = Interaction of "customized loan term and insurance claims in 90 days" attributes; Ks = Interaction of "customized loan term and savings account" attributes; $K1km$ = Interaction of "customized loan term and funds accessed within 1km" attributes; $K24hrs$ = Interaction of "customized loan term and funds transfer within 24hrs" attributes; $St90$ = Interaction of "standard loan term and claims within 90 days" attributes; Sts = Interaction of "standard loan term and savings account" attributes; $St1km$ = Interaction of "standard loan term and funds accessed within 1km" attributes; $St24hrs$ = Interaction of "standard loan term and funds transfer within 24hrs" attributes

The equation shows that there are eight interaction terms with six main attribute terms. The purpose of the interaction terms is to determine if a combination of main attributes interact to form a more or less attractive attribute bundle. These interactions make it necessary to examine the trade-off between one attribute and another. For instance, would an average small-holder crop farmer be satisfied with loan repayment that is customized even in an event of natural disaster where claims are paid in more than 120 days?

To investigate the hypothesis (Ho2) that "farmers demographics do not affect financial institution's choice", the multinomial logistic regression model was used. The multinomial logistic regression model is expressed as:

$$y_{ij} = \alpha_j k_{ij} + e_{ij}$$

y_{ij} = farmer's choice of financial institution

Where; $j = 0$ = Microfinance bank; $j = 1$ = Commercial bank; $j = 2$ = Insurance companies; $j = 3$ = Bank of Agriculture

And; α_j = Independent variables;

Where; α_1 = Age (years); α_2 = farm size (ha); α_3 = farming experience (years); α_4 = Education index (years of schooling); α_5 = Gender (male 1, female 0)

RESULTS AND DISCUSSION

Farmers' attributes for financial services: Farmers' attributes rating and acceptability of the attribute levels of financial services are presented in Tables 1a and 1b. Table 1a revealed that all five attributes were important to the respondents. The attribute ratings by the farmers ranged from 2.85 to 4.35 on a 5-point scale with insurance services, account opening and loan being the most important attributes. This implies that, for a financial institution to impact on small-scale crop farming population in Nigeria, such institution must provide services such as insurance, account opening, loan, credit/ debit cards and funds transfer. The difference in means of the attributes was compared using t-statistics test and showed clearly that, at $t_{0.01}=3.365$, "farmers' choices or preferences of a financial institution is significantly influenced by attributes of the institution" and, therefore, Ho1 is rejected.

From Table 1b, it is observed that a financial institution that offers customized loan term was most preferred to another that offered either standard or typical loan terms. Respondents equally preferred insurance claims that are paid within 90 days of application, while opening of savings account was more favoured to other account openings. In terms of funds accessibility using credit/debit cards, a distance of 1km to access funds was opted for. The respondents were, again, inclined towards funds transfer within 24 hours.

1. Loan Terms (standard, typical and customized)
2. Insurance claims (paid within 90 days, 91-120 days, more than 120days)
3. Opening of account (Savings account, Current account and fixed deposit account)
4. Funds Accessibility using Credit/debit cards (1km, 2-10km, more than 10km)
5. Fund transfer duration (within 24hours, 2-7days and more than 7 days)

Analysis of the Attributes' main effect of small scale crop farmers' satisfaction for financial services is presented in Table 2. The desirability rating of all the attributes is as given



Table 1a. Attributes Rating Statistics for Financial Services.

Statistics	Loan	Insurance	Account opening	Credit/Debit cards	Funds transfer
Mean	4.28	4.35	4.33	3.61	2.85
Mode	5	5	5	4	5
Standard deviation	1.249	0.963	0.936	1.360	1.816
Minimum	0	1	1	0	0
Maximum	5	5	5	5	5

Table 1b. Attribute Levels Desirability or Acceptability Rating.

	Loan			Insurance			Account opening		
	Standard	Typical	Customized	90	91-120	≥ 120	Saving	Current	Fixed deposit
Mean	3.38	4.23	4.33	4.73	3.42	1.88	4.38	3.73	1.77
	Credit/Debit cards			Funds transfer					
	1	2-10	≥10	24	2-7	≥7			
Mean	4.57	3.19	1.53	4.78	3.64	1.87			

in Table 1b, where the highest rank attribute for the financial services rendered formed the main attribute. The results in Table 2 revealed that, the coefficient for funds transfer duration within 24hours was positive (0.258) and significant compared to when the fund is transferred between 2-7days and more than 7 days. The implication being that, if a respondent's rating was for this attribute was 3.0 on a 5-point scale, for instance, the profile rating of a financial institution will increase to 3.258 if funds were transferred within 24hours compared to 2-7 days and more than 7 days. The coefficients for customized loan, savings account opening and funds accessibility with credit cards within 1km were positive but not significant.

Table 2. Conjoint Analysis of Overall Satisfaction of Small-Scale Crop Farmers of Attributes Main Effects of Financial Services.

Attribute	Coefficient	p-value
Customized loan term	0.034	0.594
90 days of insurance claims	-0.084	0.279
Savings account	0.003	0.941
Accessing funds within 1km	0.034	0.504
24hours of funds transfer	0.258	*0.014

*= significant at 5%

The interaction effect of the attributes: The Interaction effect between duration of funds transfer (the significant variable) and other attributes is presented in Table 3. The result shows that the interaction between 24 hours of fund transfer and customized loan term, insurance claim paid within 90 days and funds accessibility using credit/debit cards within 1km were statistically significant at 10%, 1% and 5%, suggesting that, an average small-scale crop farmer will not trade-off a financial institution that offers customized loan terms and pays insurance claims within 90 days as well as transfer funds within 24hrs for another, even though, the institution offers customized loan terms and pays insurance claims within 90

days but takes 2-7 days to transfer funds. On the other hand, the interaction between transferring funds in 2 days or more and funds accessibility using credit/debit cards within 1km was also significant. It means that, an average small-scale crop farmer, if faced with this scenario, will take other variables into consideration and, in this instant, will consider a financial institution that is swift in transferring funds (within 24hrs), than the one that will take more time (2-7days) in carrying out the same function.

Table 3. Conjoint analysis of the interaction effects between funds transfer and other attributes.

Attribute levels	Funds transfer within 24hrs		Funds transfer from 2days or more	
	Coefficient	p-value	Coefficient	p-value
Customized	0.089	*0.058	0.161	0.112
90 days	0.203	***0.000	-0.149	0.206
Savings account	0.006	0.854	-0.053	0.458
1km	0.073	**0.050	0.190	**0.019

***, **, * = significant at 1%, 5% and 10%

Farmers' Demographics on Financial Institution's Choice:

Table 4 presents the result of the estimated multinomial logit model of selected farmers' demographics on the choice of financial institution. The choice of Commercial bank as reference category was arrived at from analysis conducted, with the bank having the best fit in terms of significant variables and was more promising in terms of the diagnostics. However, the choice of a reference category may be arbitrary, but should be backed up by theory or be theoretically motivated (Nuhu, Donye, Bzugu and Ani, 2015).

From the Table, it can be observed that the set of significant explanatory variables vary across the financial institution categories. In the microfinance bank category, education index is negative and significant at 5% level of significance, implying that the higher a farmer's education, the higher the tendency of preferring commercial bank to a microfinance bank. Gender was positive and significant at 1% level of



Table 4. Multinomial Logistic Regression of Selected Farmers' Demographics of the Choice of Financial Institution.

		B	S.e	Sig.	Exp (B)
Microfinance bank	Intercept	-1.260	1.310	0.336	
	Age	0.012	0.025	0.633	3.733
	Farm size	-0.059	0.078	0.454	1.012
	Farming experience	0.040	0.032	0.207	0.711
	Education index	-0.340	0.141	**0.016	1.041
	Gender	1.358	0.495	***0.006	0.944
Bank of Agriculture	Intercept	-2.033	1.341	0.130	
	Age	0.021	0.025	0.409	4.621
	Farm size	-0.022	0.073	0.759	1.023
	Farming experience	0.041	0.032	0.203	0.724
	Education index	-0.319	0.144	**0.027	1.041
	Gender	1.409	0.507	***0.005	0.978
Insurance companies	Intercept	-3.899	1.969	0.048	
	Age	0.008	0.038	0.823	7.146
	Farm size	-0.316	0.188	*0.092	1.009
	Farming experience	0.071	0.044	0.108	0.837
	Education index	-0.185	0.197	0.346	1.070
	Gender	2.219	0.678	***0.001	0.730

Reference category is Commercial Bank

Log likelihood= 432629

Likelihood ratio= 41.410

P²= 0.205

***, **, * = significant at 1%, 5% and 10%

significance, with a positive coefficient of 1.358, and since male was 1 and female 0, it implies that, there is a likelihood of a male choosing a microfinance bank to a commercial bank.

In the second level of the dependent variable (bank of agriculture), education index and gender were negative and positive, respectively; and also significant, implying exactly as explained in microfinance bank category.

In the third category-Insurance companies, farm size was negative and significant at 10%, meaning that, the larger the farm size, the higher the tendency of choosing a commercial bank to insurance company. Gender was positive and significant at 1%, with a coefficient greater than 2, implying that a typical small-scale male farmer will, most likely, prefer an insurance company when seeking for financial services to a commercial bank. However, as the farm size increases, he may be compelled to go for a commercial bank service.

With a likelihood ratio of 41.410, which is greater than the critical chi-square of value of 30.5779 at 0.01 with df of 15, Ho2 is rejected which hypothesizes that “farmers’ demographics do not significantly affect the choice of a financial institution”.

Conclusion: Formal financial institutions play a key role in the economy of Nigeria and are very much needed to provide the necessary financial intermediation to growing the economy. However, agricultural sector is not well serviced

like other sectors and this has affected the growth of the sector and most importantly, small farmers. While these institutions disregard small farmers because of reasons best known to them, this act in itself is harming the economy because these farmers produce the bulk of food requirement of the country. Crop and livestock small farmers differ in their needs for financial services because of the nature of their production. For smallholder crop farmers, their needs are seasonal dependent, and understanding this peculiarity will better informed a potential financial provider as to what is best in terms of loan provision, for instance. It is this misunderstanding that has seriously affected the nature of service provision to the sector in particular and to different categories of farmers generally, and this study was focused on addressing this from smallholder crop farmers’ standpoint.

Therefore, the objective of this study was to evaluate attributes smallholder crop farmers have preferences for, in exploring financial services from the formal financial sector. It has been hypothesized that understanding these preferences will create a seamless financial system that is beneficial to all. Following this backdrop, this study employed the conjoint technique in estimating the attributes’ effect on farmers’ satisfaction, and the multinomial logit on their choices of a financial institution using selected demographics.

Our investigations reveal that attributes such as loan service, insurance, account opening, credit/debit cards, and fund transfer, were very key to farmers’ needs. But, farmers



basically, were attracted to institutions that provided flex loans (customized), paid insurance claim in less than 90 days, have facilities for savings account, cash withdrawal points of less than a kilometer, and funds can be received/sent in 24 hours. Further analysis reveal that farmers were satisfied with any institution that had the capability in transferring funds within 24 hours as this was the only significant variable in the conjoint analysis of attributes' main effects on farmers' satisfaction. The trade-off (interaction effect) between this significant variable and others (customized loan service, insurance claim within 90 days, savings account opening, and cash service points within a kilometer of farmer's residence) again, reveal that, customized loan service, insurance claim within 90 days, and cash service points within a kilometer were significant, which suggests that an average smallholder crop farmer is not willing to give up his customized loan service for funds transferred in 24 hours or more. In the same vein, the farmer will, instead, prefer any financial institution that insurance claim is paid within 90 days to another that funds are moved within 24 hours or more. And, providing a cash point within a kilometer of his residence is much more than having the facility to move funds in 24 hours or more. The multinomial analysis reveal that farmers' level of education, the gender, and farm size, were important variables in their choice of formal financial institutions in Nigeria. Arising from the foregoing, the study, therefore, recommends the following:

1. smallholder crop farmers place precedence on customized loan terms and payment of insurance claims within 90 days, hence, financial institutions should modify their loan terms and duration of insurance claims to conform to these, given that the socio-economic characteristics of all farmers are different and so are their productive capacities and fitting a loan repayment to suit these situations will ensure effective repayment.
2. Financial institutions should optimize their services in terms of funds transfer and funds accessibility.
3. If financial institutions can determine what is and is not important to crop farmers and indeed all farmers, the potential to become more competitive by segmenting the market and providing the desired products and services to the segmented customers will be maximized. Therefore, in servicing smallholder crop farmers, financial institutions should emphasize services that are important so as to operate maximally.

Authors' contribution: Innocent Asuquo conceived the research and wrote the original manuscript, Emmanuel Eyo reviewed and edited the manuscript while Eucharia Ajah was involved in data collection and cleaning.

Conflict of interest: There was no conflict of interest among the authors.

Acknowledgments: the authors acknowledge the work and efforts of extension officers who helped with the collection of data and the states' directors of ADPs for technical support.

Funding: authors pooled resources together for the funding of this research, there was no external funding.

Data availability: The authors declare that the manuscript is original and has not been published anywhere else before, the data is available upon request.

Consent to publish: All the authors consented to the article being published in JGIAS

REFERENCES

- Adewunmi M.O and O.A Omotesho. 2002. An Analysis of Production Objectives of Small Scale Rural Farming Household in Kwara State, Nigeria. *Journal of Rural Development Korea* 25:201-21
- Arene C.J. 1993. An analysis of loan repayment potentials of smallholder soya bean group farmers in Nigeria. *Quarterly Journal of International Agriculture* 32:60-169.
- Bard S.K, D.J Craig and M. Boehlje. 2002. Borrower Preferences in the Agricultural Credit Market: A Conjoint Analysis. Staff paper #02-03, Department of Agricultural Economics, Purdue University.
- Boyle K.J. 2003. Contingent Valuation in Practice. In Champ PA, Boyle KJ & Brown TC (Eds). *A Primer on Nonmarket Valuation: The Economics of Non-Market Goods and Resources*. Dordrech: Kluwer.
- CBN 2012. Annual reports and statistical bulletin. Central Bank of Nigeria, CBN. Abuja
- CBN 2019. Annual reports and statistical bulletin. Central Bank of Nigeria, CBN. Abuja
- DFID 2005. Growth and poverty reduction: the role of agriculture. Department for International Development, DFID. Policy paper, London.
- Etim I.J, O.E. Eyo and S. Enimu. 2017. "Analysis of Small-scale Farmers' Access to Formal Financial Services in Cross River State, Nigeria". *Donnish Journal of Agricultural Research* 4:9-14
- IFAD .2004. Livestock Services and the Poor: A Global Initiative (Collecting, Coordinating and Sharing Experiences). International Fund for Agricultural Development.
- Ike, D.N. 1986. Financing Agricultural Development in Nigeria: An appraisal. *International Journal of Development Banking* 4:67-86
- Komicha, H.H. 2007. Farm household economic behavior in imperfect financial markets. Empirical evidence and policy implications on savings, credit and production efficiency in south eastern Ethiopia. Doctoral thesis,



- Department of Economics, Swedish University of Agricultural Science, Uppsala, Sweden.
- Lancaster, K. 1966. A New Approach to Consumer Theory. *Journal of Political Economy* 74:132-157.
- Mgbeaka, R.N., E.N. Mbah and C.I Ezeano. 2015. A review of small holder farming in Nigeria's need for transformation. *Agricultural Engineering Journal* 5:19-26.
- Nuhu, H. S., A. O. Donye, P. M. Bzugu and A. O. Ani. 2015. The relationship between savings mobilization techniques and livelihood activities of rural women in Bornu State, Nigeria. *International Journal of Academic Research in Business and Social Sciences* 5:479-496
- Sabo, B.B., S.D Isah, A.M Chamo and A.M Rabi . 2017. Role of small holder farmers in Nigeria's food security. *Scholarship Journal of Agricultural Science* 7:1-5.
- Sayadi S., C. Gonzalez and J. CalatravaRequena. 2005. Ranking versus Scale Rating in Conjoint Analysis: Evaluating Landscapes in Mountainous Regions of Southeastern Spain. *Ecological Economics* 55: 539-550.
- Sidhu R.S., K. Vatta and A. kaur . 2008. Dynamics of Institutional Agricultural Credit and Growth in Punjab: Contribution and Demand-Supply Gap. *Agricultural Economics Research Review*, Conference Number 21:407-414.
- Swati B., D. Bardhan and A. Kumar. 2013. Strengthening Credit Services to Livestock Sector for Inclusive Rural Growth. *Journal of Rural Development* 32:367-381.
- Tchale, H. 2009. The Efficiency of Smallholder Agriculture in Malawi. *African Journal of Agricultural and Resource Economics* 3:101-121.
- Wachekeh, S.W. 2013. An identification and evaluation of factors influencing smallholder dairy farmers' choice of agricultural credit source: The case of Githunguri division of Kiambu County. A Master's thesis, Department of Agricultural Economics, University of Nairobi, Kenya.
- Zou, N. 2011. Canadian consumers' functional food choices: Labelling and reference dependent effects. Doctoral thesis, University of Saskatchewan, Canada.

